

RESOURCE LIBRARY

ACTIVITY : 1 HR 30 MINS

African Savanna Community Web

Students use multimedia resources and a community web to characterize and describe the environment, organisms, and feeding relationships of the African savanna ecosystem.

GRADES

5 - 8

SUBJECTS*Biology, Ecology, Geography, Human Geography, Physical Geography***CONTENTS**

4 PDFs, 1 Video, 1 Image

OVERVIEW

Students use multimedia resources and a community web to characterize and describe the environment, organisms, and feeding relationships of the African savanna ecosystem.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/african-savanna-community-web/>

Program

DIRECTIONS

1. Students use perception sketches to illustrate their observations as they listen to the National Geographic video “Ultimate Enemies.”

Tell students that they are going to make perception sketches. Instruct students to close their

eyes and listen to what they hear in the classroom. Have students listen carefully for one minute. Afterward, tell them to draw symbols and shapes (not words) in their notebooks to describe what they heard. Have students share their observations aloud. Discuss similarities and differences in what they heard. Next, explain to students that they will make another perception sketch, but this time they will be listening to the National Geographic video "Ultimate Enemies." Encourage students to listen for and sketch multiple layers of what they hear. After listening to the video, write the following questions on the board and have students share their observations aloud. Ask:

- *What symbols or shapes did you sketch? What do they represent?*
- *What is the video about?*
- *Where did the video take place?*
- *What types of animals did you hear?*
- *What type of ecological community or ecosystem do you think is represented in the video?*

Elicit from students that the video is about a community of organisms that includes birds, lions, hyenas, and elephants. Explain that this particular community lives in Botswana, Africa.

2. Students use perception sketches to illustrate their observations as they watch the same video.

After listening to the video and discussing their perception sketches, students may not know the ecosystem type yet. Without telling students the ecosystem type, play the video again, but this time allow them to watch and listen as they record their observations and responses to the questions in their notebook. Afterward, discuss students' observations. Discuss the questions again, noting whether or not students' answers have changed or become more refined. Elicit from students that the video is about organisms living in an African savanna ecosystem. Explain that a savanna is a type of tropical grassland with scattered trees.

3. Build background about ecosystem ecology: environment and communities.

Draw a two-column chart on the board and write the following heads: Terms and Notes. Then write the following terms in the left-hand column: *ecosystem*, *environment*, *organism/community*, *food chain*, and *food web*. Provide students with the Two-Column Chart worksheet or have them draw the chart and write the terms in their notebooks. In the right-hand column next to the term *ecosystem*, have students record the ecosystem type (savanna) shown in the video. Next, have them write a description of the savanna's environment next to the term *environment*. Ask: *What are the nonliving components that characterize the environment of the ecosystem?* Elicit from students that environments are characterized by soil, water, temperature, sunlight, wind, and rainfall. Explain that the African savanna is also

called tropical grassland. It has warm temperatures year-round and rainfall is seasonal, being highest in the summer. The savanna is characterized by grasses and small or dispersed trees that do not form a closed canopy, allowing sufficient sunlight to reach the ground. Tell students that a group of organisms interacting in a specific region under similar environmental conditions is called a community. Display the African Savanna Ecosystem illustration. Have students use the illustration and their video observations to record several organisms that make up the African savanna ecosystem.

4. Identify African savanna feeding relationships: food chains and food webs.

Ask: *What is a food chain?* (A food chain is a group of organisms linked in order of the food they eat, from producers to consumers, prey to predators, and scavengers to decomposers.) Using the two-column chart, have students identify one or more food chains using the organisms they listed in Step 3. Elicit responses that include organisms from different feeding levels: *producer*, *primary consumer* (herbivore), *secondary consumer* (carnivore), *omnivore*, *decomposer*, *insectivores*, *scavengers*, and *detritivores*. Use the African Savanna Illustration Key to write at least two sample food chains on the board and label their feeding levels. Ask: *Why do food chains have arrows between organisms and not just straight lines?* Elicit from students that arrows represent the flow of energy and matter between feeding levels. Be sure to point out the role of decomposers, omnivores, and other feeding groups with which students may be less familiar. Ask: *What is a food web? How is a food web related to a food chain?* Elicit from students that food chains show only one path of food and energy through an ecosystem. In most ecosystems, organisms can get food and energy from more than one source, and may have more than one predator. Healthy, well-balanced ecosystems are made up of multiple, interacting food chains, called food webs. As a class, have students practice combining two of the savanna food chains to create a food web.

5. Assign students roles in the African savanna ecosystem.

Tell students that they will build their own African savanna community web based on the organisms and environmental factors they discussed and observed throughout the activity. Have students work individually or in pairs and assign them one of the organisms or environmental factors listed in the African Savanna Background Information handout. Tell them to use string and index cards to create an ecosystem role card that includes what they represent (organism or environmental factor), and their relationship to other components of the savanna ecosystem. Students should write the name of their organism/factor on one side of the card, and then list types of interactions on the other side. Organism interactions can include feeding relationships and resources the organisms compete for or share with other organisms. Tell students they should be able to state, "I am the (what they represent) and I am

connected to (relationship to other components of the ecosystem) because..."

6. Have students create a community web for the African savanna ecosystem.

Have students stand in a large circle with their ecosystem role cards visible. One at a time, have students read aloud from their card, "I am the...and I am connected to...because..." and toss the ball of string to the environmental factor or organism (student) they are connected to. Discuss the relationships and continue building the community web until all roles are part of the web. Next, have one student let go of the string and discuss what would happen if that factor or organism were no longer part of the community web. Then, have another connected student let go of the string. With an emphasis on the African savanna ecosystem, discuss how all of the strings are essential in keeping the web together. Discuss how humans interact with the African savanna community. *Ask: What is the role of humans in the ecosystem?* (Humans are omnivores and top-level consumers. They use ecosystem resources and alter the environment so they often compete with other organisms for food and space.) *Ask: How do humans and big cats interact? What about the cattle?* Elicit from students that humans and big cats have a similar role in terms of feeding relationships. They are both top carnivores and help balance the ecosystem by consuming herbivores. Humans and lions also come into conflict because people can kill lions and destroy or use the lions' habitat for cattle and agriculture. Big cats can, in turn, kill humans and their cattle and become competitors for food and space.

TipTeacher Tip

Refer to African Savanna Background Information and Big Cats Background Information for additional content information.

Informal Assessment

Review students' two-column charts and observe students as they create and discuss their African savanna community web.

Extending the Learning

Have students create in their notebooks a complete food web using the organisms included in the African savanna ecosystem illustration.

OBJECTIVES

Subjects & Disciplines

Biology

- Ecology

Geography

- Human Geography
- Physical Geography

Learning Objectives

Students will:

- identify the environment and organisms of the African savanna ecosystem
- create a community web for the African savanna ecosystem
- identify and describe feeding relationships that comprise the African savanna food web
- discuss how humans interact with the environment and organisms of the African savanna community

Teaching Approach

- Learning-for-use

Teaching Methods

- Discussions
- Guided listening
- Information organization
- Multimedia instruction

Skills Summary

This activity targets the following skills:

- 21st Century Themes
 - Global Awareness
- Critical Thinking Skills
 - Analyzing

- Creating
- Understanding
- Geographic Skills
 - Acquiring Geographic Information
 - Answering Geographic Questions

National Standards, Principles, and Practices

NATIONAL COUNCIL FOR SOCIAL STUDIES CURRICULUM STANDARDS

- Theme 3:

People, Places, and Environments

NATIONAL GEOGRAPHY STANDARDS

- Standard 4:

The physical and human characteristics of places

- Standard 8:

The characteristics and spatial distribution of ecosystems and biomes on Earth's surface

NATIONAL SCIENCE EDUCATION STANDARDS

- (5-8) Standard C-4:

Populations and ecosystems

- (5-8) Standard C-5:

Diversity and adaptations of organisms

- (5-8) Standard F-2:

Populations, resources, and environments

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Ball of string

- Colored pencils
- Index cards
- Pencils

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, Projector, Speakers
- Plug-Ins: Flash

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction

OTHER NOTES

Use the recommended resources in "For Further Exploration" to review background information and vocabulary relevant to the ecology and feeding relationships of the tropical savanna ecosystem.

BACKGROUND & VOCABULARY

Background Information

The African savanna ecosystem is a tropical grassland with warm temperatures year round and seasonal rainfall. The savanna is characterized by grasses and small or dispersed trees, along with a diverse community of organisms that interact to form a complex food web. Carnivores (lions, hyenas, leopards) feed on herbivores (impalas, warthogs, cattle) that consume producers (grasses, plant matter). Scavengers (hyenas, vultures) and decomposers/detritivores (bacteria, fungi, termites) break down organic matter, making it available to producers and completing the food cycle (web). Humans are part of the savanna community and often compete with other organisms for food and space.

Prior Knowledge

["food chains and food webs"]

Recommended Prior Activities

- None

Vocabulary

Term	Part of Speech	Definition
Big Cats Initiative	<i>noun</i>	National Geographic Society program that supports on-the-ground conservation projects, education, economic incentive efforts, and a global public-awareness campaign to protect big cats and their habitats.
carnivore	<i>noun</i>	organism that eats meat.
community	<i>noun</i>	group of organisms or a social group interacting in a specific region under similar environmental conditions.
consumer	<i>noun</i>	organism on the food chain that depends on autotrophs (producers) or other consumers for food, nutrition, and energy.
decomposer	<i>noun</i>	organism that breaks down dead organic material; also sometimes referred to as detritivores
detritivore	<i>noun</i>	organism that consumes dead plant material.
ecosystem	<i>noun</i>	community and interactions of living and nonliving things in an area.
environment	<i>noun</i>	conditions that surround and influence an organism or community.
food chain	<i>noun</i>	group of organisms linked in order of the food they eat, from producers to consumers, and from prey, predators, scavengers, and decomposers.
food web	<i>noun</i>	all related food chains in an ecosystem. Also called a food cycle.
herbivore	<i>noun</i>	organism that eats mainly plants and other producers.
insectivore	<i>noun</i>	organism that mostly eats insects.
omnivore	<i>noun</i>	organism that eats a variety of organisms, including plants, animals, and fungi.
organism	<i>noun</i>	living or once-living thing.
predator	<i>noun</i>	animal that hunts other animals for food.
producer	<i>noun</i>	organism on the food chain that can produce its own energy and nutrients. Also called an autotroph.
savanna	<i>noun</i>	type of tropical grassland with scattered trees.
scavenger	<i>noun</i>	organism that eats dead or rotting biomass, such as animal flesh or plant material.

For Further Exploration

Images

- [African Wildlife Foundation: Wildlife Gallery](#)

Websites

- [Blue Planet Biomes: African Savanna Plants](#)
- [Biodiversity Explorer: The Web of Life in Southern Africa](#)
- [National Geographic Education: Experiencing Film—An Active Approach](#)



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